



Cancer burden and health systems in India 1

The growing burden of cancer in India: epidemiology and social context

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Cancer can have profound social and economic consequences for people in India, often leading to family impoverishment and societal inequity. Reported age-adjusted incidence rates for cancer are still quite low in the demographically young country. Slightly more than 1 million new cases of cancer are diagnosed every year in a population of 1.2 billion. In age-adjusted terms this represents a combined male and female incidence of about a quarter of that recorded in western Europe. However, an estimated 600 000–700 000 deaths in India were caused by cancer in 2012. In age-standardised terms this figure is close to the mortality burden seen in high-income countries. Such figures are partly indicative of low rates of early-stage detection and poor treatment outcomes. Many cancer cases in India are associated with tobacco use, infections, and other avoidable causes. Social factors, especially inequalities, are major determinants of India's cancer burden, with poorer people more likely to die from cancer before the age of 70 years than those who are more affluent. In this first of three papers, we examine the complex epidemiology of cancer, the future burden, and the dominant sociopolitical themes relating to cancer in India.

Introduction to cancer in India

Cancer is a major cause of morbidity and mortality in developing and developed countries alike.¹ In many low-income and middle-income countries, including India, most of the population does not have access to a well organised and well regulated cancer care system. A diagnosis of cancer often leads to catastrophic personal health expenditures.² Such expenditures can push entire families below the poverty line and may, especially when combined with an absence of what are seen as acceptable services, threaten social stability.^{3,4}

Population ageing is often assumed to be the main factor driving increases in cancer incidence, death rates, and health-care costs.⁵ However, the actual picture is more complex. In high-income countries age-standardised cancer mortality is now typically decreasing in all age groups, although more than half of all cancer deaths are people older than 70 years. In India, despite the weakness of data in terms of population coverage, no evidence exists for a decrease in age-standardised cancer mortality rates, and most deaths occur in individuals younger than 70 years.¹ These differences are only partly due to India having a relatively younger population compared with high-income countries. They are also a product of contrasting causal patterns, with infections and unique local patterns of tobacco use playing a much greater part in causing cancer in India than in richer countries. Poor access to screening and early-stage case-finding services also helps to explain the paradox of India's seemingly low cancer incidence rates but relatively high age-specific death rates.

Although improvements in living standards and Human Development Index rankings are typically linked to increases in the occurrence of, for example, sex hormone

exposure-related cancers, and cancers epidemiologically associated with reduced average family sizes,⁶ the positive gains that economic and social development bring—eg, improved food quality—normally far outweigh any such costs. The International Agency for Research on Cancer GLOBOCAN project¹ has predicted that India's cancer burden will nearly double in the next 20 years, from slightly over a million new cases in 2012 to more than 1.7 million by 2035. These projections indicate that the absolute number of cancer deaths will also rise from about 680 000 to 1.2 million in the same period.¹ Yet the extent to which cancer-related mortality and disability will actually increase partly depends on the investment decisions made in future decades in health care, cancer research, the wider public understanding of cancer harm-reduction, and on other technical or social changes that will affect disease incidence and outcomes.

Here, we review published data on the epidemiology of cancer and the cancer-related burden in India.^{1,7} We also briefly discuss the implications of factors that affect patients, health professionals, and state and government policy makers in cancer care⁴ from a policy perspective. Additionally, we explore (as a prelude to the third paper in the Series⁴) the social determinants of cancer occurrence in India, and opportunities for improving prevention and treatment through the enhanced application of existing knowledge, coupled with ongoing scientific and health service innovation. The latter will be discussed in greater depth in the second paper in this Series.⁸

Modern India's cancer burden

No national registry exists that provides comprehensive cancer incidence or mortality data for India. However, the

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This is the first in a **Series** of three papers about cancer in India

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National Cancer Registry Programme (NCRP, established by the Indian Council of Medical Research in 1981) provides population-based data from a selected network of 28 cancer registries located across the country.⁹

Information from 12 registries deemed to provide reliable data was used to estimate the national statistics presented in relevant GLOBOCAN publications.¹⁷ However, the resulting estimates have several limitations. They might, for example, be more representative of urban and south Indian populations than of those populations living in the rest of the country. Under-recording of cancer cases and deaths, especially among older people, is another problem that reduces accuracy. Nevertheless, the aggregated numbers reported through GLOBOCAN are the best available ongoing estimates of the cancer burden in India and are suitable, despite the caveats indicated, for use as the main basis for priority setting and planning of cancer management across the nation.

In addition to this primary source (and the wider NCRP data)¹ the Million Deaths Study¹⁰ is another important data resource. Researchers independently assigned causes to 122 429 deaths in 1·1 million homes in 6671 randomly selected rural and urban areas of India, using a validated verbal autopsy-based method to establish mortality cause. The Million Deaths Study provides additional useful data about the nationwide cancer burden and on regional, state, and rural versus urban variations.

Figures on the distribution of cancer treatment facilities and expertise available were obtained from various sources, including the Medical Council of India and National Board of Examinations websites, and publications issued by the Atomic Energy Regulatory Board (which licenses and monitors radiotherapy centres in India).^{11–13}

With regard to population size, data provided via the office of the Registrar General and Census Commissioner of India were used. The most recent (15th) national census was done in two phases in 2011.¹⁴ The census covered all 35 states and union territories, and, within them, 640 districts, 5924 sub-districts, 7933 towns, and

640 930 villages. The total population on March 1, 2011, was slightly more than 1210 million, of which 833·5 million individuals (69%) were classified as living rurally, and just under 500 million were listed as working in agriculture.

Other key findings from the latest census were that rural and urban populations each increased by 91 million people in 2001–11, and that the child (0–6 years) sex ratio (girls per 1000 boys) declined from 934 to 923 in rural India, and from 906 to 905 in urban areas. The literacy rate in the population aged 7 years and older was 68% in rural areas compared with 84% in urban areas, and 81% for males compared with 65% for females nationwide. These data draw attention to the complex sociocultural backdrop of the burden of cancer in India. The Indian situation reinforces the need to view cancer statistics, such as those available on survival (table 1) in the widest possible context to fully inform care and prevention strategies.

Cancer incidence and mortality

GLOBOCAN estimates that about 14 million new cancer cases were diagnosed worldwide in 2012 and slightly more than 8 million cancer deaths occurred. 1 million of these new cases and nearly 700 000 of the deaths occurred in India, which is home to about 17% of the global population (table 2). Even in age-adjusted terms the recorded incidence for India is, at 94 per 100 000 people, only slightly more than half of the world average of 182 per 100 000, and about a third of that recorded in the more developed countries (268 per 100 000).

All cancers in Indian men other than oral, lung, stomach, colorectal, pharyngeal, and oesophageal cancers have an incidence of five per 100 000 men or less. This, according to US and EU definitions, makes such cancers orphan diseases. Women have an age-adjusted incidence rate of 104·5 per 100 000 women. With the exceptions of breast, cervical, and colorectal cancers, all other cancers in Indian women also have a recorded incidence of less than five per 100 000 women.

In 2012, almost 145 000 Indian women were diagnosed with breast cancer. Nearly 400 000 of those who had reportedly been diagnosed with breast cancer in the previous 5 years were still alive. In 2009, breast cancer became the most frequently diagnosed form of neoplastic disease in women in India and is now the most common cause of cancer death in the country, accounting for more than a fifth of all female cancer mortality (figure 1).

Studies of immigrant Indian populations in settings such as the UK and the USA show a growing convergence between their experiences of cancer and those of their surrounding communities.^{15,16} However, in India, the burden of disease is still strikingly unlike that in post-industrial nations. In men, the more common cancers are tobacco-related. For Indian women, cervical cancer is the second most common incident cancer (figure 1A). Cervical cancer is also the second most common cause of cancer deaths when both sexes are combined (figure 1B). In childhood cancers, treatment still remains incomplete

	Cervical cancer	Breast cancer	Oral cancer	Rectal cancer	Colon cancer	Non-Hodgkin lymphoma
Barshi 1993–2000; followed up to 2003	35·1%	55·3%	23·6%	13·0%	NA	25·4%
Bhopal 1991–95; followed up to 2000	30·8%	25·3%	33·9%	4·0%	3·2%	8·8%
Chennai 1990–99; followed up to 2001	60·2%	47·1%	35·6%	NA	NA	21·5%
Karunagapalli 1991–97; followed up to 1999	54·8%	44·8%	42·3%	43·6%	NA	36·0%
Mumbai 1992–94, followed up to 1999; and 1995–99, followed up to 2003	48·2%	43·8%	35·0%	26·1%	25·4%	34·2%

Data taken from Sankaranarayanan and Swaminathan.¹⁸ NA=not available.

Table 1: Age-standardised relative survivals at 5 years for five of the most common treatable cancers in different regional populations of India, with case detection period

and survival in general is lower in India than in more developed countries. However, for children treated in comprehensive cancer centres, survival approaches that in Europe or the USA.¹⁷

A substantial difference also exists between the ratios of cancer incidence to mortality recorded in economically developed countries compared with emergent economies (table 2). India is no exception to this pattern, which is affected by causal variations, stage at diagnosis, and the availability and use of cancer treatments. The cancer mortality rate in India is high, at 68% of the annual incidence. This ratio indicates that fewer than 30% of Indian patients with cancer survive 5 years or longer after diagnosis. In view of the limitations in the available data, the true proportion could be significantly lower. By contrast, in North America and western Europe overall 5-year survival for all cancers is about 60%. Delayed diagnoses and inadequate, incorrect, or suboptimum treatment (including patient inability to access or complete appropriate therapies) are the chief factors that cause poor cancer survival in India.^{18,19}

Similarly, population-based 5-year survival for common childhood cancers is less than 50% of the results reported from developed countries.²⁰

Regional variations

The burdens imposed by cancer vary greatly between regions within India.⁷ Figure 2 shows differences in the recorded incidence in 12 parts of the country. Cancer incidence and mortality are generally higher in the more affluent states. However, cancer mortality rates are also significant contributors to mortality in rural regions and where cancer treatment facilities are scarce. Poor individuals are also at a higher age-specific mortality risk than are affluent people (table 3).¹⁰ The extent to which these apparently conflicting observations are an artifact associated with variables such as the fact that some cancers occur much more frequently in the rural parts of the north-eastern states than in urban areas or southern and western India is uncertain and hotly debated. It should be remembered that, even allowing for under-recording, cancer causes no more than 10% of annual deaths in India; nevertheless, the rapid growth in absolute numbers of cancer cases is a major public health issue for India which needs better cancer registration and national statistics.

To make cancer a notifiable disease might be one way to improve assessments of the national burden, as would establishment of new and improved registries wherever they are needed. However, such progress will take time. In the interim, results of additional carefully conducted sample survey-based investigations like the Million Deaths Study¹⁰ could provide more insight into issues such as the extent of regional variations, and help to further inform overall cancer policy and care delivery. A final point to emphasise is that the total cancer burden in India is projected to increase substantially from about 1 million new cases in 2012 to

	Incident cases	Deaths	Incidence ASR	Mortality ASR	Mortality to Incidence ratio
Very high HDI	5 780 821	2 606 104	279.2	105.3	37.7
High HDI	2 126 439	1 244 496	180.2	102.3	56.8
Medium HDI	5 232 474	3 656 562	144.2	102.8	70.9
Low HDI	943 102	690 141	112.8	86.7	76.9
India	1 014 934	682 830	94.0	64.5	68.6

HDI=human development index. Data from GLOBOCAN online analysis for 2012.¹ ASR=age-standardised rate, adjusted for world population and in 100 000 population.

Table 2: Cancer incidence and mortality in India in very high, high, medium, and low development index regions, 2012

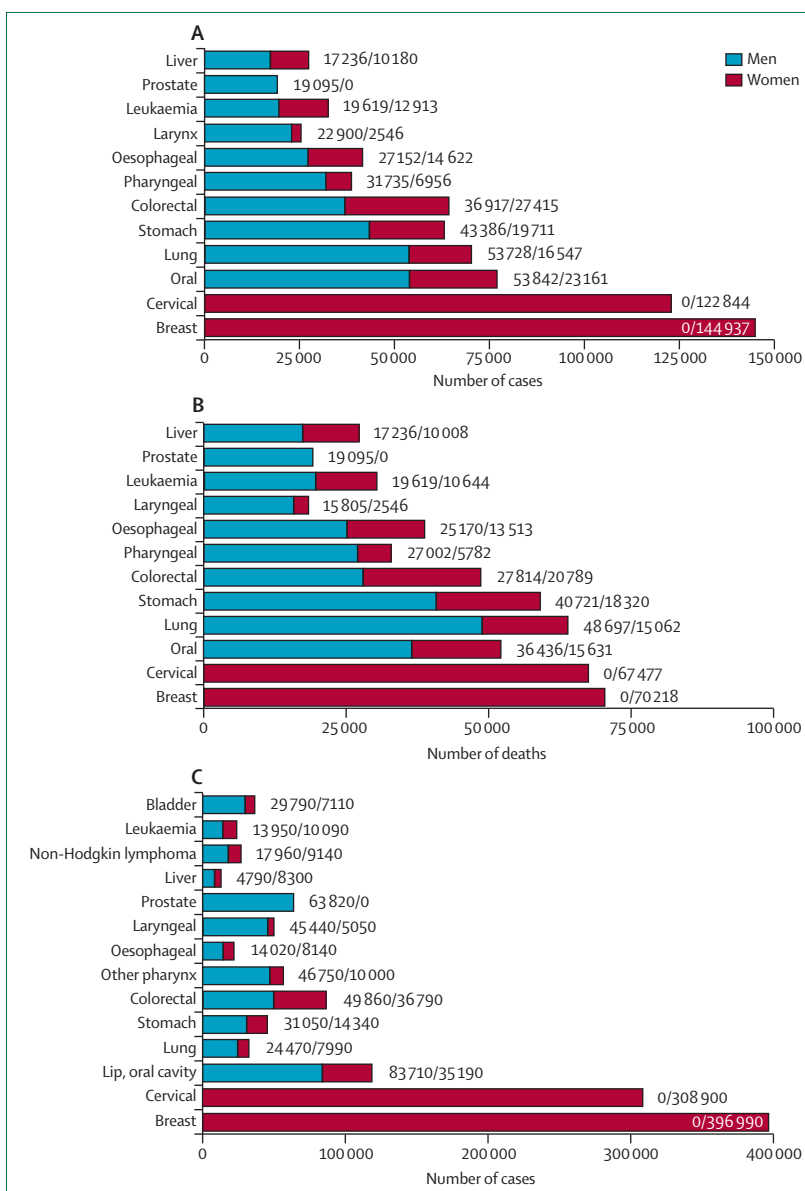


Figure 1: Incidence (A), mortality (B), and prevalence (C) of the most common cancers in Indian men and women in 2012

Data from GLOBOCAN 2012.¹

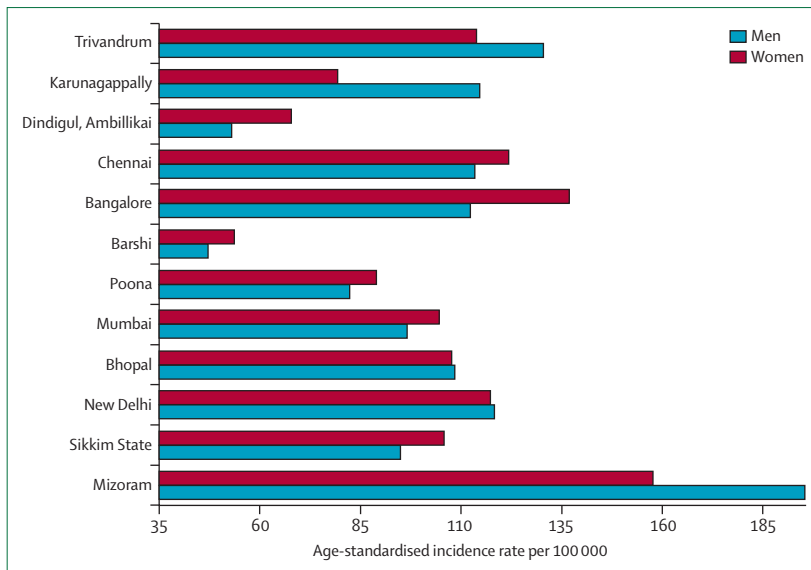


Figure 2: Regional variations in the age-adjusted incidence rates of cancer in men and women in different regions of India

Data extracted from Forman and colleagues.⁷

	Illiterate	Primary school	Secondary school and above
Total cancer deaths in men (ASR)	106.6	93.4	45.7
Total cancer deaths in women (ASR)	106.7	64.2	43.4
Tobacco-related cancer in men (ASR)	39.3	37.5	18.2
Tobacco-related cancer in women (ASR)	19.5	10.1	7.2
Infection-related cancer in men (ASR)	24.3	17.8	7.6
Infection-related cancer in women (ASR)	41.2	21.7	10.3
Estimated burden of deaths in men in thousands	79.2	34.3	16.2
Estimated burden of deaths in women in thousands	140.2	15.3	5.4

Data from Dikshit and colleagues.¹⁰ ASR=age-standardised rates per 100 000.

Table 3: Burden of cancer deaths in Indians by educational status in individuals aged 30–69 years

more than 1.7 million per year by 2035, primarily because of ageing of the population (figure 3). Additionally, although age-specific incidence and mortality might start to decrease, the prevalence will rise as a consequence of enhanced survival, as and when that is achieved.

India's cancer burden in a social context

Since India regained independence in 1947, its population has quadrupled, from about 300 million to 1.2 billion.¹⁴ In the same period, average life expectancy at birth has increased by about two thirds, from less than 40 years to 65 years for men and women combined. Significant economic growth has also occurred since the early 1980s, with a sharp increase from the start of the 1990s. Such national success deserves recognition; however, in overall terms the gross domestic product (GDP) per person remains low, at about US\$1500.

In purchasing-power-adjusted terms, this is equivalent to only about a third of the figure now recorded for China and only 5–10% of that in western Europe and North America. Despite the ability of countries such as Cuba (which has a GDP of about US\$5000 per person) and Indian states such as Kerala and Tamil Nadu to achieve relatively good health outcomes, future health developments will be integrally linked to the nation's economic fortunes and collective commitment to equity and universal health-care provision. From a patient perspective the social contract underpinning the country's progress arguably needs a strengthened focus on good quality health-care access generally, rather than on cancer prevention and treatment only.

India's demographic and epidemiological transitions have been slow compared with the progress achieved in the past half century in many other parts of Asia. The population is still fighting relatively high rates of parasitic, bacterial, and viral diseases (which are collectively the direct cause of about a third of all deaths), while encountering increasing levels of illness caused by conditions such as stroke, ischaemic heart disease, type 2 diabetes, and cancer.²⁰ This double burden (together with that associated with traffic and work-place accidents and hazards such as snake bites) sets a complex health-policy challenge. Effective policies must bridge the continuing public-health task of infection control and the modern goal of non-communicable disease prevention and management. In the case of nutrition, for example, India needs a transition strategy that will both combat malnutrition and guard against the rapidly increasing obesity rates seen in emergent nations such as Mexico and Egypt.

Partly because of continued rapid population growth linked to both enhanced survival and only gradually decreasing birth rates, the proportion of the population aged over 65 years is still little more than 5%. Some commentators regard a young population as a national strength—they believe that, as birth rates continue to decrease, this will eventually release a so-called demographic dividend in India that will generate a major developmental surge. Such observers might see population ageing as a threat, not least because it will increase the overall incidence of cancers that are not infection-linked.

Against this idea, other observers warn that high and still-increasing populations in themselves represent a key challenge to communities trying to escape poverty—they note that, as life expectancies rise, age-specific rates of disabling disease tend to fall in line with mortality. From this perspective, the pursuit of healthy and active ageing should already be as much a priority for modern India as is the continuing reduction of maternal and child deaths.

India is a country traditionally more accustomed to accepting disparities in wealth and health between different community groups than with confrontation of social and gender inequities. Nevertheless, India's low rate of public expenditure on health care is, in some ways, a surprising as well as a serious problem. India

invests less than 1·5% of its GDP on central government-funded and state-funded health care, out of a total public plus private spend of little more than 4% of GDP. No other comparable nation spends as small a proportion of its national resources on public health care. The situation is further complicated by factors such as poor fiscal governance; sub-optimum (health sector-related) relationships between the federal and state governments; poor public health expertise (compounded by inadequate medical and other health professional education); substantial regional variations; and gross education, caste, and class-related inequalities in income and access to services. Provision of more acceptable standards of cancer care and enhanced preventive services will be very difficult without increased public expenditures on health at both the state and central government levels.

Promotion of cancer patients' interests

From a health-gain standpoint, India's immediate priorities should include improving preventive and primary-care services to reduce the burden of disease linked to factors such as inadequately managed hypertension and, in the case of cancers, tobacco product use, indoor and outdoor pollution, and infections such as human papillomavirus, hepatitis B, and *Helicobacter pylori*.²⁰ Diagnosis of diseases like oral, cervical, and breast cancers at earlier stages is also needed to save lives and reduce distress, especially when this can be linked to better and more accessible pain management.

Given that the poorest two-thirds of the population is in much greater need of better health-care provision than is the wealthiest third, increased public investment in health services needs to be a public policy priority for India. However, well directed health spending should also benefit all sections of society. Innovations such as the establishment of the National Rural Health Mission (now being rolled out across the country as the National Health Mission) and the introduction of insurance schemes such as the Rashtriya Swasthya Bima Yojna (RSBY) and similar state-level initiatives are examples of positive progress,^{21,22} as is the recent publication of a Planning Commission of India-inspired plan for the provision of universal health coverage.^{23,24} The development of comprehensive cancer centres in settings such as Ahmedabad, Chennai, Guwahati, Mumbai, and Thiruvananthapuram, with their community-outreach programmes, represent another important step forward in the specific sphere of cancer care.

Nevertheless, improvements in health-care access and delivery have been small so far, and public health improvement in India has (notwithstanding relevant constitutional commitments) been less of a political priority than in other countries at a similar developmental stage. The volume of calls for infrastructural improvements in India in non-health service areas, ranging from energy and clean water supply to improved transport and waste disposal facilities, might partly explain this difference. But,

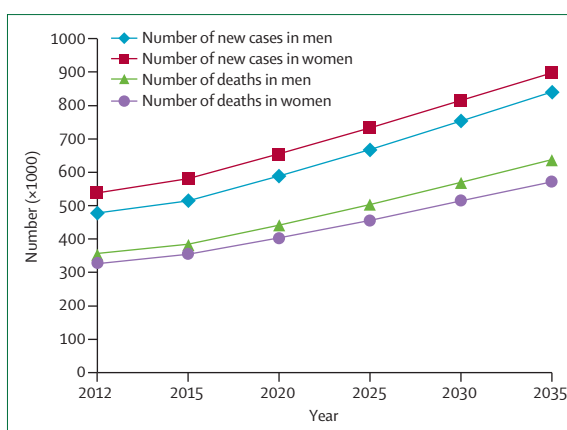


Figure 3: Estimated projected incidence and mortality burden of all cancers in Indian men and women to 2035

Data from GLOBOCAN 2012.¹

from a sociological and political science perspective, the fact that modern India has retained many of its ancient cultural roots in living forms is also significant.

India is a highly stratified, ethnically diverse society, with a strong emphasis on family and other kinship-linked responsibilities for provision of personal care. Equally, there has seemed to be a corresponding absence of a commonly perceived need to contribute to universal service funding. With respect to cancer services and all other forms of health-service delivery, this partly explains why costs are largely paid as out-of-pocket expenditures.^{4,24}

This expenditure is especially apparent in the case of outlays on drugs. In manufacturers' prices, medicines of all types probably account for about 20% of Indian health spending.²⁵ But because their costs (which in practice often encompass additional practitioners' fees) are very visible to people who have poor access to other services, outlays on medicines have been a key focus of attention. This focal point might, on occasions—along with an absence of public, professional, and political awareness of the underlying social and allied determinants of public health—have concealed more fundamental policy concerns. In the cancer services context, this has been typified by disputes about the licensing and pricing of patented anticancer treatments.²⁶

One core reason why the infrastructure for management of India's cancer burden is insufficient is the severe shortage of appropriately educated medical and other health personnel, and of the training facilities needed to produce them (table 4). Linked to this, factors such as the preferences of doctors and other health professionals for working in more affluent areas, and the effects of a largely unregulated private sector, have resulted in a skewed geographical distribution of cancer treatment facilities.

The available evidence suggests that about 60% of specialist facilities are located in regions to the south and the west of India.⁴ However, more than 50% of the

population live in the central and eastern regions, distorting service provision. For example, at least half of patients with cancer will be judged to need radiotherapy at some point. Yet data published by the Atomic Energy Regulatory Board indicate that the 26% of the population living in the eastern region of India have immediate access to only 11% of radiotherapy facilities (figure 4). Cancer surgery and radiotherapy provision are available only on a highly inequitable geographical basis, and radiotherapy is significantly under-resourced (the last systematic analysis in 2007 showed that there were 347 teletherapy units across India against a requirement of 1059).²⁷ Addressing the social determinants of cancer

and cancer-related needs must go hand-in-hand with improvement in cancer care capacity and delivery capability across India.

As early as 1946, the Bhole Committee drew attention to cancer as a problem in India, and made several recommendations for the establishment of accessible services;²⁸ nevertheless, nearly 70 years later, many Indians with cancer still have to travel long distances for medical care. This situation can exacerbate sex, age, and socioeconomic biases. Women, the frail, elderly people, and those with low incomes are unlikely to have the resources and support they need to travel safely despite the improvements in, for example, rail concessions.

Even when people in need of cancer therapy can reach treatment centres, they typically have to stay in what are often over-crowded and unhygienic dharmashalas, or non-religious lodging houses.²⁹ Many are at increased risk of contracting infections (including those caused by drug-resistant pathogens), and so might be unable to complete treatment regimens in a timely way or attend follow-up care sessions.³⁰ This could well be one of the factors that contributes to India's disproportionately high cancer incidence-to-mortality ratios, alongside late diagnosis. To ensure safety and quality of treatments is a difficult area to study. India has a complex set of interlocking legal regulations and regulatory frameworks;³¹ however, a major challenge to cancer equity is the fact that poor sectors of society are more likely than are wealthier groups to receive poor quality treatment from less-qualified institutions.³²

Conclusion

The burden of cancer in India is intimately linked to the country's major socioeconomic inequalities in access to health care and other areas. Rebalancing the distribution of power, social goods, and resources³³ will be a crucial determinant of how India will address its cancer burden in the long term. Failure to address social inequalities reduces survival and can needlessly increase the costs of cancer to individuals and Indian society as a whole.

Even greater losses of welfare are associated with long-standing weaknesses in the country's public health system and its capacity to deliver preventive services.³⁴ These weaknesses have limited India's ability to protect its citizens from the key causes of cancer and treat the disease in a timely and successful way when it occurs. To achieve better outcomes will demand new ways of thinking among individuals and groups at all levels, including political leaders, the medical profession, patient organisations, and the public as a whole.

At the root of the solutions to India's cancer burden is the need for political commitment and action. Measures such as a fully committed effort to reduce, and, in the long term, eliminate, use of tobacco products through the vigorous implementation of the Framework Convention on Tobacco Control, would in time substantially decrease the incidence of, and consequently the mortality caused by,

	University-affiliated postgraduate degrees		National Board of Examinations-affiliated postgraduate degrees		Total	
	Colleges	Seats	Colleges	Seats	Colleges	Seats
Medical oncology	14	61	15	26	29	87
Clinical haematology	7	14	2	4	9	18
Radiation oncology	64	196	22	33	86	229
Surgical oncology	13	58	19	31	32	89

Data from Medical Council of India²¹ and National Board of Examinations.²² Number of MBBS seats is 49 918 per year from 381 colleges. Number of colleges running all three courses is nine. Duration of training is 3 years.

Table 4: Training facilities and yearly intake for formal training of oncology staff in India, by postgraduate course

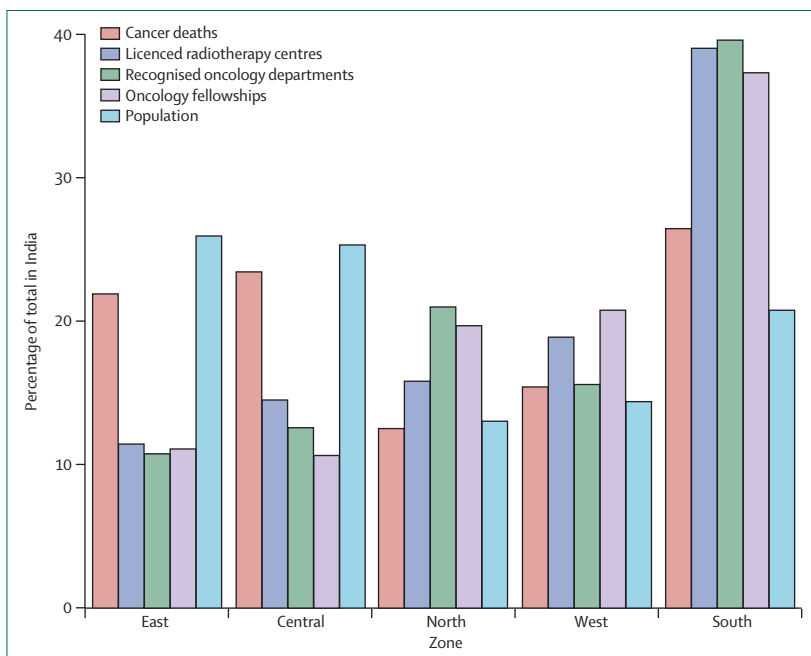


Figure 4: The distribution of the population (2011) and cancer mortality (2010) in five zones of India compared with the corresponding proportions of radiotherapy centres, oncology departments, and postgraduate oncology training positions

The 35 states and union territories of India included in the five zones are: East Zone (Bihar, Jharkhand Orissa, West Bengal, Sikkim, Assam, Arunachal Pradesh, Manipur, Mizoram, Meghalaya, Nagaland, Tripura); Central Zone (Chhattisgarh, Madhya Pradesh, Uttar Pradesh, Uttaranchal); North Zone (Jammu and Kashmir, Punjab, Haryana, New Delhi, Rajasthan); West Zone (Goa, Maharashtra, Gujarat, Daman and Diu, Dadara, and Nagar Haveli); and South Zone (Kerala, Tamil Nadu, Karnataka, Andhra Pradesh, Pondicherry, Andaman and Nicobar islands, Lakshadweep).

Search strategy and selection criteria

We identified data sources for this review by searching Medline, PubMed, Google Scholar, and references from relevant articles, using the search terms “cancer”, “India”, “epidemiology” and “burden”. We included only articles published in English and after Jan 1, 2000. We searched the websites of the International Agency for Cancer Research, the Medical Council of India, National Board of Examinations, Atomic Energy Regulatory Board, and Registrar General and Census Commissioner of India for relevant data since 2010.

many common forms of cancer in India.³⁵ So, too, could investments in cost-effective vaccination and screening programmes aimed at infection-related cancers, such as cervical cancer (human papillomavirus) and liver cancer (hepatitis B). Public health initiatives directed at improving nutrition, better urban planning to provide exercise space, and prevention of obesity in India’s population would also slow increases in lifestyle-associated cancers. India’s political challenge is to develop convergent health policies that address both communicable and non-communicable diseases.³⁶

The continuing improvement of cancer outcomes will require changed priorities and strong national, regional, and district leadership.³⁷ It will also demand increased public spending on both primary health care and specialist facilities in every Indian state⁴ and more emphasis on improvement of cancer research in India.⁸ Addressing of the cancer burden in India will require continued focus on other major social determinants of good outcomes—particularly education.³⁸ In view of the acute suffering of people with advanced disease, oncologists and others with patient interests at heart will wish to see the requirements of seriously ill patients met as rapidly and fully as possible, especially when new palliative or curative opportunities become available. But prevention of cancer wherever possible will generate greater long-term benefit. To truly serve public interests, Indian policy makers should be aware of this last reality, along with the importance of focusing rigorously on overcoming the fundamental barriers to provision of affordable, equitable, and universal cancer care for the entire population.

Contributors

MKM and DGT contributed equally to this paper and are joint first authors. MKM, DGT, ADP, CSP, JAG, and RS designed this policy analysis with the National Cancer Grid of India, and drafted the framework document. All other authors contributed equally to writing and revising the final paper.

Declaration of interests

We declare that we have no competing interests.

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